day, followed by winter at night. From a medium temperature of 20°C while the sun shone we have experienced a fall of 9° or 10°, and the maximum of 25° has been followed by a minimum many degrees under zero in the nocturnal hours. Congestion in many cases has been caused by the heat at midday, and, on the other hand, in as many instances by the cold of midnight.

In every district where fruit is grown, and especially in the vine country, serious damage has been done by the unseasonable frost. In the champaign country the thermometer registered 5°C below zero during the first nights of May and the vineyards suffered severely. Those of Touraine and Anjou also were damaged, while from Bourgogne and from all points in the South of France we hear the same chorus of lamentation. Particularly malign in its influence this year, the April moon has scored innumerable victims in the vegetable world. The loss is estimated at many millions.

POOR MOON.

Poor moon! It will be difficult indeed to exonorate it after such an indictment. Yet is it more culpable, really, than its accusers?

As a matter of fact, what is the April moon? Generally, the definition that I gave a long time ago has been adopted; i. e., it is the moon which rises after Easter.

I gave this definition in consonance with the popular idea, contrary to the dictum of the Annual of the Bureau of Longitudes, because it is the only one which is acceptable. The definition of the Annual is, in effect, this:

"The name April moon is given to the moon which rises in its first quarter in April and is full either at the end of the month or, more ordinarily, in the early part of May."

Now the moon may rise in April, for instance, on the 1st, 2d, or 3d and be full neither at the end of the month nor in the beginning of May, for it would be a full moon the 15th, 16th, or 17th. Such a definition as that quoted is, therefore, not only not correct, but it implies a contradiction, and it may easily be seen what a degree of uncertainty and confusion may arise from it. In 1905 it is noted that the April moon appeared April 4, finishing its course May 4. This is in contradiction to the definition.

If any definition is to be held free from popular prejudice it certainly must be in harmony with its own terms. Gardeners, horticulturists, and all cultivators of the soil are imbued with this prejudice, because they fear the frosts of the last half of April and of the first two weeks of May. These are for them the most critical periods, which they believe are administered by the disastrous April moon and which, according to this definition, they have long associated with the feast of Easter. This festival is determined for the Sunday following the first full moon after March 21 (the spring equinox). Easter can not come before March 22, and the new moon following can not rise before April 5. In this definition of the April moon this lunation begins at its very earliest only on April 5 and ends on May 5, never beginning April 4, 3, 2, or 1. Yet generally, the full moon rises at the end of April or in the first days of May. When Easter is late (its date varies between March 22 and April 25), the April moon appears in May. Note particularly that Easter is determined and its date fixed by astronomy.

This year, 1909, the April moon appeared April 20 and was gone May 19. This lunation, so much dreaded, is not designed to arouse our fears, but it serves rather as a convenient point from which to contemplate a characteristic time of the year, that in which takes place the struggle of spring to overcome the last onslaughts of winter. *It is the change of seasons that is alone responsible for damage to vegetation, and every year it is the same so far as this phase of the year is concerned.*

TEMPERATURES ARE DIFFERENT.

If the night is clear there is a great deal of radiation from the earth into space, whence there results a sensible lowering of the temperature of the ground reaching many degrees below zero (centigrade), while the ambient air is maintained at a temperature some degrees above. It has been proved that objects can acquire in the nocturnal hours a temperature differing from that of the atmosphere which envelopes them. For example, if you suspend in the air in the evening small balls of cotton you will often find that their temperature is 6°, 7°, and even 8°C below that of the surrounding atmosphere. Vegetable growth is subject to the same effects. Thus a plant may be frozen hard while the thermometer hanging near by indicates a temperature much above 0°C.

When it is cloudy this phenomenon does not occur. The temperature of the atmosphere, the earth, plants, etc., remains the same. The clouds form a screen or veil and prevent the heat stored in the ground during the day from escaping and ascending toward the celestial vault at night. On the contrary, if no obstacle be opposed to it the nocturnal radiation dissipates the heat and the temperature of the ground is lowered rapidly. Soon the frost seizes in its cruel grip the plants that are still frail, the too delicate flowers and the young shoots on tree and shrub; the watery juices, which are very abundant in newly formed vegetable tissues, become frozen, are enlarged in volume and burst the receptacle in which they are contained. In the morning the solar rays caress the flowers and the buds mortally hurt by the cold of the night, giving them a pale yellow hue, which precedes their final dissolution in a very few days. The result would be the same if the moon did not exist. This is so true that sometimes a very simple precaution only is necessary to save the young cultures during this disastrous lunation; a veil of mist, a cloud of smoke, or even a little sheet of paper may serve as protection against the cold, perhaps averting a heavy loss.

To resume, let us say that the destruction of vegetation takes place when the atmosphere is transparent and the nocturnal radiation is intense. It is under the same circumstances, that is, when the heavens are serene and pure, that the moon sheds her white light upon the earth. But the moon is wholly innocent of the mischief that is attributed to her influence.

Moreover, the great thermometric variations that are observed, especially at this season of the year, attract our attention principally because of their grievous results. Nevertheless, such variations are to be noticed quite as much throughout the year. Ancient proverbs must not be taken too literally. For example, these three days, May 11, 12, and 13 are known by the names of the "saints of the ice," Saint Marmentius, Saint Pancras, and Saint Gervais. Now these saints of the ice are no more existent than the April moon, and the dates mentioned exhibit cold or warmth indifferently without any regularity. Neither in the one case or the other is there the least sign of an astronomical phenomenon.—*Camille Flammarion.*

## SCIENTIFIC TRESPASS.

In his admirable address[1] on Earthquakes before the American Association of Geographers, Dr. G. K. Gilbert, as geologist, offered the following remarks, which apply equally well to meteorologists.

You are not to infer that an apology is made because I trespass on fields to which I have no title, for I am an advocate of the principle of scientific trespass. The specialist who forever stays at home and digs and delves within his private inclosure has all the advantages of intensive cultivation—except one; and the thing he misses is cross-fertilization. Trespass is one of the ways of securing cross-fertilization for his own crops and of carrying cross-fertilization to the paddock he invades. Hypotheses, the trial theories which compete for development into final theories, spring by the principle of analogy from earlier and successful theories, and the broader the investigator's knowledge of explanatory science the greater his opportunity to discover hypotheses that may be applied to his own problems. Progress is ever through the interaction of the sciences one on another; and scientific trespass is one of the profitable modes of interaction. The trespasser brings with him a mental attitude and a mental equipment which are new to the subject, and whether or no the idea he contributes eventually "makes good," its contribution creates a new category for observation and opens a new avenue of inquiry. And he carries back with him the pollen of new ideas.

## WHAT IS THE CHINOOK WIND?

"The history of words is the history of the nation." The truth of this quotation from an early philologist is well exemplified by the following paragraph quoted from the Portland Oregonian:

In its present acceptation a "chinook" is the equatorial trade wind that blows during the winter months from the southwest and, laden with moisture, strikes the Pacific coast from the northern boundary of California to the Alaskan Archipelago. It is now the local name for the soft, balmy, south wind.

But it is a misnomer. In early days in Oregon, and even as late as the early seventies, our summer wind from the northwest was called a "chinook," so named because it blew into the Willamette Valley from the coast region inhabited by the Chinook Indians north of the entrance of the Columbia. Among the pioneers and their descendants a chinook wind was a "clearing up" wind. Now it signifies precisely the opposite, i. e., a wind from the south followed by rain.

Within the past twenty-five years the word has been grafted into the speech and the written language of the vast territory east of the Cascade Mountains, and circulates freely throughout Wyoming. It has been carried into western Nebraska. In recent years it has crept into Boston newspapers with local application. Any soft, balmy wind that springs up in winter is called a chinook.

Thus we see in an age of high civilization and universal knowledge the vicissitudes of written words. Within thirty years "chinook" has been turned "end for end."

The changes perpetually going on in the spelling of words are paralleled by equally radical changes in their meanings. The movement for simplified spelling represents the modern scientific, economical, labor-saving and socialistic spirit as contrasted with the individualistic, autocratic, and arbitrary spirit of the past generations. There is no continuous per-

[1] See Science, 1909, 29 (n. s.): 122.